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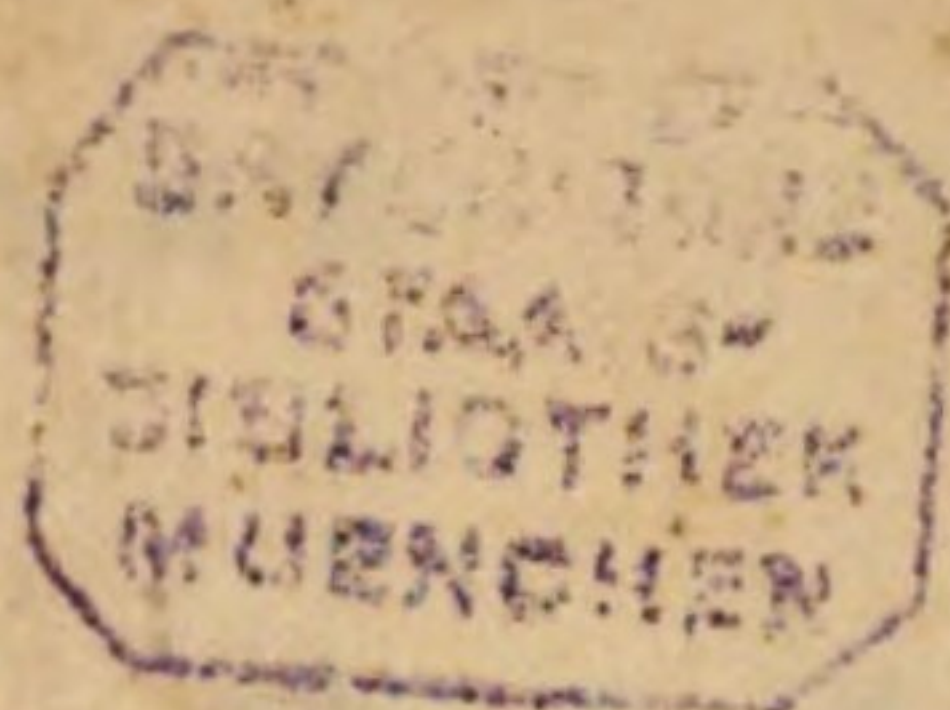
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Math. A. 230.

Geogr. miscell.

R

Probability.



THE
P R O B A B I L I T Y
OF REACHING
THE NORTH POLE
DISCUSSED.

[Price Two Shillings and Six Pence.]

THE HISTORY

THE

PROBABILITIES

OF REASONING

THE NORTH POLE

DISCOVERED

[Price Two Shillings and Six Pence.]



THE
PROBABILITY
OF REACHING
THE NORTH POLE
DISCUSSED.

..... Nec fit terris
Ultima Thule.
SENECA in Medea.



L O N D O N,
Printed for C. HERDINGER, in the STRAND.
M.DCC.LXXV.

THE
PROBABILITIES

OF REACHING
THE NORTH POLE

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INSTANCES OF NAVIGATORS

WHO HAVE REACHED

HIGH NORTHERN LATITUDES.

Read at a Meeting of the Royal Society, May 19, 1774.

AS I was the unworthy proposer of the voyage towards the North Pole, which the Council of the Royal Society recommended to the Board of Admiralty, I think it my duty to lay before the Society such intelligence as I have happened to procure with regard to navigators having reached high Northern latitudes^(a); because some of these accounts seem to promise, that we may proceed further towards the Pole than the very able Officers, who were sent on this destination last year, were permitted to penetrate, notwithstanding their repeated efforts to pass beyond eighty degrees and an half.

I shall begin, however, by making an observation or two with regard to the Greenland fishery, which will in a great measure account for our not being able to procure

(a) It is well known that there are many such accounts in print, but to these I need not refer the Society.

procure many instances of nearer approaches to the Pole, than the Northern parts of Spitzbergen.

Fifty years ago such apprehensions were entertained of navigating even in the loose, or what is called *sailing ice*, that the crews commonly continued on shore, from whence they only pursued the whales in boats.

The demand, however, for oil increasing, whilst the number of fish rather decreased, they were obliged to proceed to sea in quest of them, and now by experience and adroitness seldom suffer from the obstructions of ice ^(b).

The masters of ships, which are employed in this trade, have no other object but the catching as many whales as possible, which as long as they can procure in more Southern latitudes, they certainly will not go in search of at a greater distance from the port to which they are to return: they therefore seldom proceed beyond N. lat. 80, unless driven by a strong Southerly wind, or other accident.

Whenever this happens also, it is only by very diligent inquiries that any information can be procured; for the masters, not being commonly men of science, or troubling their heads about the improvement of geographical knowledge, never mention these circumstances on their return, because they conceive that no one is more interested about these matters than they are themselves.

(b) These particulars I received from Captain Robinson, whom I shall have hereafter occasion to mention.

themselves. Many of the Greenland masters are likewise directed to return after the early fishery is over, provided they have tolerable success; so that they have no opportunity of penetrating to the Northward.

To these reasons it may be added, that no ships were perhaps ever sent before last summer with express instructions to reach the Pole, if possible, as most other attempts have been to discover a N.E. or N.W. passage, which were soon defeated by falling in with land.

Having thus endeavoured to shew that the instances of ships reaching high Northern latitudes must necessarily be rare, I shall now proceed to lay before the Society, such as I have been able to hear of since the voyage towards the N. Pole was undertaken during last summer.

When this was determined upon, and mentioned in the News Papers, it became matter of conversation amongst the crews of the guardships, and Andrew Leekie, an intelligent seaman on board the Albion (then stationed at Plymouth), informed some of the officers that he had been as far North as $84\frac{1}{2}$.

When he was asked further on this head, he said that he was on board the Reading, Captain Thomas Robinson, in 1766, and that whilst he was shaving the captain, Mr. Robinson told him that he had probably never been so far to the Northward before, as they had now reached the above mentioned degree of latitude.

Having happened to hear this account of Leekie's, on my return to London this winter, I found out Captain Robinson, who remembered his having had this conversation

versation with Leekie, but said that he was mistaken in supposing that they had reached $84\frac{1}{2}$ N. lat. as they were only in $82\frac{1}{2}$.

Captain Robinson then explained himself, that he had at this time computed his latitude by the run back to Hakluyt's Headland in 24 hours; from which, and other circumstances mentioned in my presence before two sea officers, they told me afterwards that they had little or no doubt of the accuracy of his reckoning. Mr. Robinson likewise remembers that the sea was then open, so that he hath no doubt of being able to penetrate to 83, but how much further he will not pretend to say.

This same captain, in the ship St. George, was, on the 15th of June 1773, in N. lat. $81^{\circ} 16'$, by a very accurate observation with an approved Hadley's quadrant, in which he also made the proper allowance for the refraction in high Northern latitudes, at which time seeing some whales spouting to the Northward, he pursued them for five hours, so that he must have reached $81\frac{1}{2}$, when the sea was open to the Westward and E.N.E. as far as he could distinguish from the mast-head. His longitude was then 8 degrees E. from the meridian of London.

Captain Robinson is a very intelligent seaman, and hath navigated the Greenland seas these twenty years, except during the interval that he was employed by the Hudson's Bay Company^(c).

I could

(c) He lived during this winter in Queen-street, near Greenland-dock, Rotherhithe: he hath failed, probably, by this time on the Greenland fishery.

With

I could add some other, perhaps interesting, particulars, which I have received from Captain Robinson, with regard to Spitzbergen and the Polar seas; I will only mention, however, that he thinks he could spend a winter not uncomfortably in the most Northern parts we are acquainted with, as there are three or four small settlements of Russians in Spitzbergen for the sake of the skins of quadrupeds, which are then more valuable, than if the animal is taken in summer.

The next instance I shall mention of a navigator who hath proceeded far Northwards is that of Captain Cheyne, who gave answers to certain queries drawn up by Mr. Dalrymple, F. R. S. in relation to the Polar seas, and which were communicated last year to the Society.

Captain Cheyne states in this paper, that he hath been as far as N. lat. 82, but does not specify whether by *observation* or his *reckoning*, though from many other answers to the interrogatories proposed, it should seem that he speaks of the latitude by *observation*. Unfortunately Captain Cheyne is at present on the Coast of Africa, so that further information on this head cannot be now procured from him.

Whilst the ships destined for the N. Pole were preparing, a most ingenious and able sea officer, Lieutenant John Cartwright, told me that twelve years ago he had been informed of a very remarkable voyage made by Captain Mac-Callam as far nearly as 84 N. lat.

This

With regard to his having been in N. lat. 81° 30', in June 1773, he can prove it by his journal, if that evidence should be required.

This account Mr. Cartwright had received from a brother officer, Mr. James Watt, now a lieutenant in the Royal Navy, who was on board Captain Mac-Callam's ship.

I thought it my duty to acquaint the Admiralty with this intelligence, who would have sent for Mr. Watt, but he was then employed on the coast of America.

On his return from thence within the last month, Mr. Cartwright introduced a conversation with regard to Captain Mac-Callam's voyage, when Mr. Watt repeated all the circumstances which he had mentioned to him twelve years ago; after which Mr. Cartwright, thinking that I should be glad to hear the particulars from Mr. Watt himself, was so good as to bring him to my chambers, when I received from him the following information:

In the year 1751 Mr. Watt, then not quite seventeen years of age, went on board the *Campbeltown* of Captain Mac-Callam, which ship was at that time employed in the Greenland fishery.

It seems that during the time the whales are supposed to copulate, the crews of the Greenland vessels commonly amuse themselves on shore.

Captain Mac-Callam however (who was a very able and scientific seaman) thought that a voyage to the N. Pole would be more interesting, and that the season being a fine one, he had a chance of penetrating far to the Northward, as well as returning before the later fishery took place. He accordingly proceeded without

the least obstruction to $83\frac{1}{2}$, when the sea was not only open to the Northward, but they had not seen a speck of ice for the last three degrees, and the weather at the same time was temperate; in short Mr. Watt hath never experienced a more pleasant navigation.

It need be scarcely observed, that the latitude of $83\frac{1}{2}$ was determined by observation, as the great object of the voyage was to reach the Pole; the Captain therefore, the mate, and young Mr. Watt, determined the latitude from time to time, both by Davis and Hadley's quadrants: to this I may add, that their departure and return were from and to Hakluyt's Headland.

When they were advancing into these high Northern latitudes, the mate complained that the compass was not steady, on which Captain Mac-Callam desisted from his attempt, though with reluctance; knowing that if any accident happened, he should be blamed by his owners, who would be reminded certainly by the mate of the protests he had made against the ship's proceeding further Northward.

Several of the crew however were for prosecuting their discoveries, and Mr. Watt particularly remembers the chagrin which was expressed by a very intelligent seaman, whose name was John Kelly; Captain Mac-Callam also, after his return from that voyage, hath frequently said, in the presence of Mr. Watt and others, that, if the mate had not been faint-hearted, the ship possibly might have reached the pole.

Both

Both Captain Mac-Callam and the mate are now dead, and it is rather doubtful whether the ship's journal can be procured.

It remains therefore to be considered what may be objected to the credibility of this very interesting account.

I have stated that Mr. Watt was not at the time this voyage took place quite seventeen years of age, but I have also stated that he observed himself (as well as the master and mate), from time to time. Is it therefore more extraordinary he should remember with accuracy that, two and twenty years ago, he had been in N. lat. $83\frac{1}{2}$, than that at the same distance of time, he might recollect that he had been at a friend's house which was situated 83 miles and an half from London? Or rather indeed is not his memory, with regard to this high latitude, much more to be depended upon, as the circumstance is so much more interesting?

To this I may add, that it being his first voyage, and so remarkable a one, Mr. Watt now declares that he remembers more particulars relative to it, than perhaps in any other since that time; Mr. Watt also being of a scientific turn, the high Northern latitude was likely to make a more strong impression upon him: other sea officers have likewise told me, that the circumstances of their first voyages are most fresh in their memory, the reason for which is too obvious to be dwelt upon.

If Mr. Watt's recollection however is distrusted, this objection extends equally to Captain Mac-Callam's frequent declarations, that, if the apprehensions of the
mate

mate had not prevented, he might possibly have reached the N. Pole; and how could he have conceived this, unless he had imagined himself to have been in a very high Northern latitude?

But it may be possibly said, that this voyage took place above twenty years since, and that therefore at such a distance of time no one's memory can be relied upon.

It is true indeed that Mac-Callam made this attempt in 1751, but Mr. Watt continued his services the following year in a Greenland ship, and therefore, traversing nearly the same seas, must have renewed the recollection of what he had experienced in the preceding voyage, though he did not then penetrate further than N. lat. 80.

This however brings it only to 1752, but I have already stated, that within these twelve years he mentioned all the particulars above related to his brother officer, Lieutenant Cartwright.

Mr. Watt also frequently conversed with Captain Mac-Callam about this voyage after both of them had quitted the Greenland ships; Mr. Watt rising regularly to be a Lieutenant in his Majesty's service, and Captain Mac-Callam becoming Purser of the Tweed man of war.

It so happened that in the year of the expedition against Belleisle, Mr. Watt, Captain Mac-Callam, and Mr. Walker (commonly called Commodore Walker, from his having commanded the Royal Family priva-

teers in the late war) met together at Portsmouth, when they talked over the circumstances of this Greenland voyage, which Mr. Walker was interested in, by having been the principal owner of the *Campbeltown*.

Mr. Watt's memory was therefore again refreshed with regard to all these circumstances: Mr. Walker is indeed now in Spain, but is expected to return very soon, which if he should do, I will not fail to lay an account before the Society of the conversation which then passed at Portsmouth.

Mr. Watt and Captain Mac-Callam met also eleven years ago in London, when they as usual conversed about the having reached so high a Northern latitude.

I now come to my last proof, which I received from Dr. Campbell, the able continuator and reviser of Harris's Collection of Voyages.

In that very valuable compilation, Commodore Roggewein's circumnavigation makes a most material addition, some of the most interesting particulars of which were communicated by Dr. Daillie, who was a native of Holland^(d), and lived in Racquet-court, Fleet-street, about the year 1745, where he practised physick.

Dr. Campbell went to thank Daillie for the having furnished him with Commodore Roggewein's voyage, when Daillie said that he had been further both to the Southward

(d) He was a grandson of Daillie, who was author of a book, much esteemed by the Divines, entitled "*De Ufu Patrum*."

Southward and to the Northward than perhaps any other person who ever existed.

He then explained himself as to the having been in high Southern latitudes, by sailing in Roggewein's fleet ^(e), and as to his having been far to the Northward, he gave the following account:

Between fifty and sixty years ago it was usual to send a Dutch ship of war to superintend the Greenland fishery, though it is not known whether this continues to be a regulation at present.

Dr. Daillie (then young) was on board the Dutch vessel employed on this service ^(f), and during the interval between the two fisheries, the Captain determined, like Mr. Mac-Callam, to try whether he could not reach the Pole, and accordingly penetrated (to the best of Dr. Campbell's recollection) as far as N. lat. 88, when the weather was warm, the sea perfectly free from ice, and rolling like the bay of Biscay. Daillie now pressed the Captain to proceed, but he answered that he had already gone too far by having neglected his station, for which he should be blamed in Holland, on which account also he would suffer no journal to be made, but returned as speedily as he could to Spitzbergen.

There are undoubtedly two objections which may be made to this account of Dr. Daillie's, which are, that

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it

(e) Roggewein reached S. lat. 62° 30'. See Harris.

(f) Dr. Campbell does not recollect in what capacity he served, but, as he afterwards practised physick, he might probably have been the surgeon.

it depends not only upon his own memory, but that of Dr. Campbell, as no journal can be produced, for the reason which I have before stated.

The conversation between Dr. Campbell and Daillie arose from the accidental mention of Roggewein's voyage to the Southward; and can it be supposed that Daillie invented this circumstantial narrative on the spot, without having actually been in a high Northern latitude?

If this be admitted to have been improbable, was he not likely to have remembered with accuracy what he was so much interested about, as to have pressed the Dutch Captain to have proceeded to the Pole?

But it may be said also that we have not this account from Daillie himself, but at second hand from Dr. Campbell, at the distance of thirty years from the conversation.

To this it may be answered, that Dr. Campbell's memory is most remarkably tenacious, as is well known to all those who have the pleasure of his acquaintance; and, as he hath written so ably for the promotion of geographical discoveries in all parts of the globe, such an account could not but make a strong impression upon him, especially as he received it just after the first edition of his compilation of voyages.

No one easily forgets what is highly interesting to him; and, though I do not pretend to have so good a memory as Dr. Campbell, I have scarcely a doubt, but that if I should live thirty years longer, and retain my
I faculties,

faculties, I shall recollect with precision every latitude which I have already stated in this paper.

What credit, however, is to be given to all these narratives is entirely submitted to the Society, as I have stated them most fully with every circumstance which may invalidate, as well as support them; and if I have endeavoured to corroborate them by the observations which I have made, it is only because I believe them.

It should seem upon the whole of the inquiries upon this point, that it is very uncertain when ships may penetrate far to the Northward of Spitzbergen, and that it depends not only upon the season, but other accidents, when the Polar seas may be so free from ice as to permit attempts to make discoveries^(g).

Possibly, therefore, if a king's officer was sent from year to year on board one of the Greenland ships, the lucky opportunity might be seized, and the Navy Board might pay for the use of the vessel, if it was taken from the whale fishery, in order to proceed as far as may be towards the North Pole.

(g) Captain Robinson hath informed me, that at the latter end of last April, a Whitby ship was in N. lat. 80, without having been materially obstructed by the ice.

DAINES BARRINGTON, F.R.S.

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which I have already stated in this paper.

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as may be towards the North Pole.

(?) Captain Robinson had informed me, that at the latter end of last
April, a Whaler, ship was in 74. lat. 80, without having seen any
ice.

DANIELS BARRINGTON, F.R.S.

ADDITIONAL

P R O O F S

THAT

T H E P O L A R S E A S

A R E O P E N.

Read at a Meeting of the Royal Society, Dec. 22, 1774.

THE HISTORY OF THE
ROYAL SOCIETY OF LONDON
FROM THE YEAR 1660 TO 1703

ADDITIONAL
PAGES

OF THE

THE HISTORY OF THE
ROYAL SOCIETY OF LONDON
FROM THE YEAR 1660 TO 1703
ADDITIONAL
PAGES

Read at a Meeting of the Royal Society, Dec. 22, 1774.
The following paper was presented to the Society at the above
meeting, and was read by the Secretary, Mr. John Canton.
It contains a list of the names of the persons who have been
admitted into the Society since the year 1703, and also a
list of the names of the persons who have died since that
year.



A D D I T I O N A L
P R O O F S, &c.

Read at a Meeting of the Royal Society, Dec. 22, 1774.

AS I happen to have collected many additional facts since my paper, containing Instances of Navigators who had reached high Northern Latitudes, was read before the Society in May last, I shall take the liberty to state them according to chronological order; together with some general reasons why it may be presumed, that the Polar seas are, at least sometimes, navigable.

I think it my duty to do this, not only because I was the unworthy proposer of the Polar voyage in 1773, which was recommended by the Council of the Royal Society to the Board of Admiralty; but because it would not redound much to the credit of the Society, if they planned a voyage to reach the N. Pole, if possible, when a perpetual barrier of ice prevented any discoveries in the Spitzbergen seas to the Northward of $80\frac{1}{2}$, which is not a degree beyond the most common station of the Greenland fishers.

D

I must

I must here, however, repeat, that no one is more entirely satisfied than myself of the great abilities, perseverance, and intrepidity, with which the officers who were sent on this destination, attempted to prosecute their discoveries; but I conceive, from the arguments and facts which will follow, that they were stopped by a most unfortunate barrier of ice (of great extent indeed), but which was only temporary, and not perpetual.

If such a wall of ice hath been constantly fixed in this latitude, and must continue to be so, there is an end to all discoveries to be made to the Northward of Spitzbergen; but if it is only occasional, the attempt may be resumed in some more fortunate year.

The point therefore being of so much importance to geography, I hope the Society will pardon me, if I more fully enter into the subject than I did in my former paper.

The English have long taken the lead in geographical discoveries. One of our ships of war is lately returned after having penetrated into the Antarctic circle; and is it not rather a reflection upon a scientific nation, that more is not known with regard to the circumpolar regions of our own hemisphere, than can be collected from maps made in the time of Charles I. especially when the run from the mouth of the Thames to the N. Pole is not a longer one, than from Falmouth to the Cape de Verde islands?

Though

Though I have the honour to be a Fellow of a Society instituted for the promotion of Natural Knowledge, the prejudices of an Englishman are so strong with me, that I cannot but wish the discoveries to be made in the Polar seas may be achieved by my countrymen; but if we are determined to abandon the enterprize, science is to be honoured from whatever quarter it may come, and it hath therefore given me great satisfaction to hear, that Mons. de Bougainville is soon to be sent on discoveries to the Northward.

In the outset of my former paper, I said I should not trouble the Society with any instances of navigators having reached high Northern latitudes, which had appeared in print. During the course of this summer, however, I have happened to find three such accounts, which were never before alluded to, and which are extracted from books that are not commonly looked into, or at least often consulted upon points of geography.

When the Royal Society was first instituted, it was usual to send queries to any traveller who happened to reside in England, after having been in parts of the world which are not commonly frequented.

In the year 1663, Mr. Oldenburg, then secretary of the Society, was ordered to register a paper, entitled, "Several Inquiries concerning Greenland, answered by Mr. Grey, who had frequented those parts."

The 19th of these queries is the following:

"How near any one hath been known to approach
"the Pole?"

D 2

Answer.

Answer. "I once met upon the Coast of Greenland,
 "a Hollander, that swore he had been but half a de-
 "gree from the Pole, shewing me his journal, which
 "was also attested by his mate; where they had seen
 "no ice or land, but all water."

After which Mr. Oldenburgh adds, as from himself,
 "This is incredible^(a)."

It may not be improper therefore, after mentioning
 this first instance of a navigator's having approached so
 near to the Pole, to discuss upon what reasons Mr.
 Oldenburgh might found this his very peremptory
 incredulity.

Was it because the fact is impossible upon the very
 stating it?

This puts me in mind of the incredulity which is
 generally shewn to a passage in Pliny, even after the
 actual fact hath shewn not only the possibility, but easy
 practicability of what is alluded to. Pliny informs
 us^(b), that Eudoxus flying the vengeance of king Lathy-
 rus

(a) See Dr. Birch's History of the Royal Society, vol. I. p. 202. These
 queries are nineteen in number, to which the answers are very circumstantial.
 I had an opportunity of reading them over to three very intelligent masters of
 Greenland ships, who confirmed every particular. One circumstance I think it
 right to take notice of, though it does not immediately relate to the point in
 discussion, which is, that there are coals in Spitzbergen, by which seven of Mr.
 Grey's crew were enabled to bear the severity of the winter, having been left
 behind by an accident. One of the Greenland masters, to whom I read Mr.
 Grey's answers, confirmed this particular; saying, that he had burnt himself
 Spitzbergen coals, and that they were very good.

(b) L. II. ch. 67.

-rus sailed from Arabia, and reached the Straits of Gibraltar: yet no one scarcely will believe this account of Eudoxus's navigation, notwithstanding this course is so often followed.

Was it because no Englishman had then been so far to the Northward?

It is very easy, however, to account why such attempts should rather be made by the Dutch than the English, in the infancy of the Greenland fishery.

The Southern parts of this country were discovered by Sir Hugh Willoughby, A. D. 1553; after which, no English ships were sent on that coast for nearly fifty years. In the beginning of the last century, however, a competition arose between the English and Dutch, with regard to the whale fishery, and the English drove the Dutch from most of the harbours, under the right of first discoverers, in which they were supported by royal instructions; so that the Dutch were obliged to seek for new stations, whereas the English were commonly in possession of the Greenland ports, which they considered as their own^(c).

Did Mr. Oldenburgh disbelieve the Dutchman's relation, because ice is frequently met with to the Southward of N. lat. 80?

Ice

(c) See Purchas, *passim*. Whilst these disputes continued, the Dutch often sent ships of war to protect their Greenland traders, which accounts for Dr. Daille's sailing in such a vessel to 88, as I have stated in my former paper

Ice is commonly seen upon the great bank of Newfoundland, and the harbour of Louisburgh is often covered with it, which is only in N. lat. 46; yet Davis and Baffin have penetrated, under nearly the same meridians, beyond 70.

I will now suppose the tables turned between the two hemispheres of our globe, and that a Southern discoverer, meeting with ice upon the banks of Newfoundland, returns to his own hemisphere fully impressed with the impossibility of proceeding much to the Northward of N. lat. 46; would not his countrymen be deceived by the inferences which were drawn from what had been observed in the seas of the Northern hemisphere?

Bouvet, in 1738, penetrated to 53 S. lat. and in a meridian 5 degrees to the W. of the Cape of Good Hope, in which situation he fell in with floating ice; after which he did not proceed any further. Our two ships of war, lately sent upon discoveries to the Southward, however, have been some minutes within the Antarctic circle, upon a no very distant meridian from that in which Bouvet failed.

Must the fact be disbelieved because all the ice in the Polar seas comes from the Northward? But this is not so, as Mr. Grey informs us^(d), that the S. E. wind brings the greatest quantity of ice to the Coasts of Spitzbergen; which indeed is highly probable, as this wind

(d) Dr. Birch's Hist. R. Soc.

wind blows from those parts of the *Frozen Sea* into which the great rivers of Siberia and Tartary empty themselves. My own poor conception with regard to the floating ice in the Spitzbergen seas is, that these masses come almost entirely from the same quarter, as it is so difficult to freeze any large quantity of salt water. These pieces of ice, therefore, being once launched into the *Frozen Sea*, are dispersed by winds, tides, and currents, in every direction, some of them being perhaps carried to very high Northern latitudes, from which they are again wafted to the Southward.

But allowing, for an instant, that all the ice may come from the Northward, must not then an open sea be left in the higher Northern latitudes, from which these masses of ice are supposed to have floated?

Was it because the more one advances towards the Pole, vegetation invariably is diminished?—But this is not the fact.

Nova Zembla, situated only in N. lat. 76, produces not even any sorts of grass^(e); so that the only quadrupeds which frequent it are foxes and bears, both of which are carnivorous. In the Northern parts of Spitzbergen, on the other hand, they have reyn-deer, which are often excessively fat; and Mr. Grey mentions three or four plants, which flower there during the summer^(f).

Was

(e) Purchas, vol. I. p. 479.

(f) Dr. Birch's Hist. R. Soc. vol. I. p. 202, et seq.

Was it because no one had ever conceived it possible to proceed so far as the Pole?

Thorne, however, a merchant of Bristol, had made such a proposal in the reign of Henry VIII; and I shall now also shew, that not only Mr. Oldenburgh's contemporaries continued to believe such a voyage to be feasible, but many great names in science who lived after him.

Wood failed on the discovery of a N. E. passage to Japan in 1676; and, in the publication of his voyage, he hath stated the grounds upon which he conceived such a passage to be practicable; the strongest of all which, perhaps, is the relation of Captain Goulden, with regard to a Dutch ship having reached N. lat. 89. Though this account hath often been referred to, I do not recollect to have seen it stated with all the circumstances which seem to establish its veracity beyond contradiction: I shall therefore copy the very words of Wood^(g).

“ Captain Goulden, who had made above thirty
“ voyages to Greenland, did relate to his majesty, that
“ being at Greenland, some twenty years before, he
“ was

(g) Moxon's account of a Dutch ship having been two degrees beyond the Pole, was also much relied upon by Wood, which hath never been printed at large, but in a now very scarce tract of Moxon's, and in the second volume of Harris's Voyages, p. 396. In confirmation of this very circumstantial and interesting narrative, I have only to add, that Moxon was hydrographer to Charles II. and hath published several scientific treatises. - See the Catalogue of the Bodleian Library.

“ was in company with two Hollanders to the eastward of
 “ Edge’s island; and that the whales not appearing on
 “ the shore, the two Hollanders were determined to go
 “ further Northward; and in a fortnight’s time re-
 “ turned, and gave it out that they had sailed into the
 “ lat. 89; and that they did not meet with any ice, but
 “ a free and open sea; and that there run a very hollow
 “ *grown* sea, like that of the Bay of Biscay. Mr.
 “ Goulden being not satisfied with the bare relation,
 “ they produced him four journals out of the two ships,
 “ which testified the same, and that they all agreed
 “ within four minutes.^(b)”

Having thus stated Wood’s own words, it should
 seem, that they who deny the authenticity of the rela-
 tion, must contend that the crews of both these Dutch
 ships entered into a deliberate scheme of imposing upon
 their brother whale fishers, and had drawn up four
 fictitious journals accordingly, because so many are
 stated to have been produced out of the two ships to
 Captain Goulden, whilst each of them varied a few
 minutes in the latitude; whereas if they had deter-
 mined to deceive Captain Goulden and his crew, the
 journals would probably have tallied exactly. I must
 beg leave also to make an additional observation on
 the account as stated by Wood, which is, that the
 Dutch ships only went to the Northward, in search of
 whales, but did not give it out that they intended to
 make

(b) Wood’s Voyage, p. 145. *Grown sea*, is the expression in the original.

make for the Pole, which if they had done, it might possibly have been an inducement to carry on the deception, by a fictitious set of journals. To this it may likewise be added, that the Dutch are not commonly jokers. I have already remarked, that Wood makes this account one of the principal reasons for his undertaking the N. E. passage to Japan. Wood therefore (Mr. Oldenburgh's contemporary) was not a disbeliever, before his voyage, of the possibility of reaching so high a Northern latitude, nor of any of the circumstances stated in this narrative.

But Captain Wood is not a single instance of such credulity, as the very year before he sailed on his voyage, we find in the Philosophical Transactions for 1675 ⁽¹⁾ the following passage: "For it is well known
"to all that sail Northward, that most of the Northern
"coasts are frozen up many leagues, though in the open
"sea it is not so, *no nor under the Pole itself*, unless by
"accident." In which passage, the having reached the Pole is alluded to as a known fact, and stated as such to the Royal Society.

Wood indeed, after not being able to proceed further than N. lat. 76, discredits in the lump all the former instances of having reached high Northern latitudes, in the following words:

"So here the opinion of William Barentz was con-
"futed, and all the Dutch relations, which certainly
"are

(1) N^o 118.

“ are all forged and abusive pamphlets, as also the relations of our countrymen ^(k).”

In justice, however, to the memories of both English and Dutch navigators, I cannot but take notice of these very peremptory and ill-founded reflections, made by Wood; and which seem to be dictated merely by his disappointment in not being able to effect his discovery.

Wood attempted to sail in a N. E. direction between Spitzbergen and Nova Zembla, but was obstructed by ice, so that he could not proceed further than the W. coast of Nova Zembla in N. lat. 76. Thinking it, therefore, prudent to return, he at once treats as fabulous, not only the ideas of that most persevering navigator William Barentz, but likewise all other accounts of ships having reached high Northern latitudes. Now that the ice which obstructed Wood in N. lat. 76 was not a perpetual, but only occasional barrier, appears to demonstration, by the Russians having not only discovered, but lived several years in the island of Maloy Brun, which lies between Spitzbergen and Nova Zembla, and extends from N. lat. $77^{\circ} 25'$ to $78^{\circ} 45'$ ^(l).

E 2

As

(k) Wood's Voyage, p. 181.

(l) See the English Translation of professor Le Roy's account of this Island, p. 85. London, 1774, 8vo, printed for C. Heydinger, in the Strand. See also the Sieur de Vaugondy's *Essai d'une Carte Polaire Arctique*, published in 1774, who represents this island as extending from N. lat. $77^{\circ} 20'$ to $78^{\circ} 30'$, its longitude being 60 degrees E. from Ferro.

As for Wood's treating all discoveries towards the Pole, from the Northern parts of Spitzbergen, as fabulous, he had not the least foundation, from what he had observed on his own voyage, for this unmerited aspersions upon their veracity; because if Wood's barrier between Spitzbergen and Nova Zembla, in N. lat. 76, had been perpetual, what hath this to do with the course of a ship sailing from the Northern parts of Spitzbergen, upon a meridian towards the Pole?

I cannot, however, dismiss Wood's voyage, without making some further remarks on his concluding, that the obstructions which he met with in N. lat. 76 were perpetual.

Almost every voyage to seas, in which floating ice is commonly to be found, proves the great difference between the quantities, as well as size of these impediments to navigation, though in the same latitude and time of the year.

Davis in his two first voyages to discover the N. W. passage, could not penetrate beyond 66; but in his third voyage, in 1587, he reached $72^{\circ} 12' (m)$.

In the year 1576, Sir Martin Frobisher passed the Straits (since called from their first discoverer) without any obstructions from ice: in his two following voyages however, he found them in the same month, to use his own expression, "in a manner shut up with a long mure of ice (n)." In

(m) See Hakluyt and Purchas, vol. I. p. 84.

(n) Purchas, *ibid.*

In the year 1614, Baffin penetrated to 81, and thought he saw land as far as 82 to the N. E. of Spitzbergen, which is accordingly marked in one of Purchas's maps. During this voyage he met, near Cherry island, situated only in 74 N. lat. two banks of ice; the one, 40 leagues in length, the other 120; which last would extend to 25 degrees of longitude in N. lat. 76, where Wood fixes his barrier.

It need therefore scarcely be observed, that such a floating wall of ice, 120 leagues long, by being jammed in between land, or other banks of ice, might afford an appearance indeed of forming a perpetual barrier, when perhaps, within the next 24 hours, the wall of ice might entirely vanish.

Of the sudden assemblage of such an accumulation of ice, I shall now mention two, rather recent instances.

I have been very accurately informed, that the late Colonel Murray happened to go, in the month of May, from one of our Southern colonies to Louisburgh, when the harbour was entirely open; but on rising in the morning, it was completely filled with ice, so that a waggon might have passed over it in any direction.

I have also received the following account from an officer in the royal navy, who was not many years ago on the Newfoundland station.

In the middle of June, the whole straits of Bellisle were closed, in the same manner with the harbour of Louisburgh, and for three weeks together, a carriage might have passed from one shore to the other; when
 4 upon

upon rising in the morning, the ice had almost entirely disappeared. Such is the sudden accumulation and removal of ice, in latitudes 24 and 30 degrees to the Southward of Wood's situation.

I shall now endeavour to shew, that Dr. Halley was no more incredulous with regard to the possibility of reaching high Northern latitudes, than Captain Wood was, before the ill success of his voyage on discovery.

Mr. Miller, in his Gardener's Dictionary, hath the following passage, under the article, THERMOMETER:

“ Mr. Patrick has fixed his thermometer to a scale of
 “ ninety degrees, which are numbered from the top
 “ downwards, and also a moveable index fixed to it.
 “ The design of this is to shew, how the heat and cold
 “ is changed from the time it was last looked upon,
 “ according to the different degrees of heat and cold in
 “ all latitudes. As by the trial of two thermometers,
 “ which have *been regulated abroad*; the one by Dr.
 “ Halley, in his late Southern voyage; and the *other by*
 “ *Captain Johnson, in his voyage to Greenland*; the first
 “ hath a heat under the equinoctial line, and the other
 “ *a degree of cold in 88 degrees of N. latitude.*”

I have taken some pains to find out a more full account of this voyage of Captain Johnson's; but have only met with the following confirmation of it perhaps, in the 1st vol. of Mons. de Buffon's Natural History^(*).

“I have

(*) Vol. I. p. 215, quarto.

“ I have been assured, *by persons of credit*, that an
 “ English captain, whose name was Monson, instead of
 “ seeking a passage to China between the Northern
 “ countries, had directed his course to the Pole, and
 “ had approached it within two degrees, where there
 “ was an open sea, without any ice.”

As the Captain *Monson* mentioned in this passage, reached exactly the same degree of latitude with Captain *Johnson*, I should rather think, that this is the same voyage; especially, as it is well known, that the French writers seldom trouble themselves about the orthography of foreign names.

If this, however, should not be the case, it must be admitted to be an additional instance of a ship's having reached N. lat. 88, as well as *Monf. de Buffon's* giving credit to such relation^(p).

Having therefore not been able to pick up any other circumstances in relation to Captain *Johnson's* voyage, I shall now state what seems to be fairly deducible from the passage which I have copied from *Miller's Gardener's Dictionary*.

Dr. Halley made his voyage to the Southward in 1700; on the return from which, he probably employed

(p) To this list of credulous persons (as perhaps they may be considered by some) I shall beg leave to add the names of *Maclawrin* and *Dr. Campbell*. The former of these was so persuaded of the seas being open quite to the Pole, that he hath not only advised this method of prosecuting discoveries; but as I have been informed, was desirous of going the voyage himself.

ployed Patrick, as the most eminent maker of weather glasses^(q), to graduate a thermometer, according to the heat he had experienced under the equator. It was very natural therefore, when such a point of heat was to be marked upon the instrument, to graduate it either for high Southern, or Northern latitudes.

It should seem then, that Dr. Halley had procured Captain Johnson (who was master of a Greenland ship) to carry a thermometer on his voyage to Spitzbergen, and that he fortunately was able to reach so high a degree of latitude as 88.

If the thermometer had been calculated only for imaginary degrees of heat and cold, it would have been marked for the Equator and the Pole; whereas it was only graduated for 88 degrees of N. latitude, which Captain Johnson therefore had as clearly reached, as Dr. Halley had the Equator.

At all events, Patrick's thermometer must have been made under Dr. Halley's inspection; and would he have permitted it to be marked for 88 degrees of N. latitude, according to Captain Johnson's voyage, if he had disbelieved his narrative?

My third and last instance, from any printed authority, but in a book which is not commonly to be met with, is, that of Captain Alexander Cluny, as by a map, engraved under his direction, the very spot is marked

(q) I have been informed, that his shop was in the Old Bailey, and that he died about fifty years ago.

marked to the Westward of Spitzbergen, and in somewhat more than 82 degrees of N. latitude, where he saw neither land nor ice ^(r).

Before I proceed, however, to state several other instances of reaching high Northern latitudes, which have never appeared in print, and which I have collected since my last paper on this head, I must beg the indulgence of the Society, whilst I lay before them some additional reasons why the Polar seas may be conceived to be navigable ^(s).

Speculative geographers have supposed, that there should be nearly the same quantity of land and sea in both hemispheres, in order to preserve the equilibrium of the globe.

It

(r) See the American Traveller, London, 1769, quarto; as also, the Sieur de Vaugondy's *Essai d'une Carte Polaire Arctique*, published in 1774; where however, he lays down this spot from Cluny's map in little more than 81, whereas it is fully in 82. The longitude of this spot is 30 degrees E. from Fero.

(s) I have lately received a letter from the Rev. Mr. Tooke, Chaplain to the Factory at St. Petersburg, dated December 30, 1774, which he concludes in the following manner: "I have a fact or two to communicate, which seem
"to indicate, if not to a certainty, yet at least to a great degree of probability,
"that the sea is open to the Pole the year throughout; but my paper will not
"hold them." From the accuracy with which several other interesting particulars are stated in this letter, I have great reason to regret, that I have not an opportunity of laying the facts alluded to before the Public, with all their circumstances, as I have reason to suppose, that Mr. Tooke's information came from Archangel seamen.

It is possible indeed, that this may be accounted for by the Antarctic seas being more shallow than those near the North Pole; as we do not know this, however, by the actual soundings, but are informed by Captain Fourneaux, that there is no land even as far as the Antarctic circle, upon the meridian in which he sailed; as also, that no land was observed during the course of his circumnavigation in 55 S. lat. at a medium, it seems necessary, as the quantity of land so greatly preponderates in the Northern hemisphere, that from N. lat. $80\frac{1}{2}$ to the Pole itself, must be chiefly, if not entirely sea.

Let us now consider, whether such a sea is probably at all times in a state of congelation.

I do not know, whether it hath been settled by thermometrical observations, that there is any material difference between the heat under the Equator, and that which is experienced within the Tropics; most travellers complain indefinitely of its excess in such latitudes.

As this point, therefore, seems not to have been settled by the thermometer, let us have recourse to what is found to be the freezing point upon mountains, situated almost under the Equator, and compare it with the same height on the Pic of Teneriff, which being in N. lat. 28, is five degrees to the Northward of the tropical limits.

The French Academicians suppose, that the freezing point, at which all vegetation ceases, and ice takes
 3 place,

place, commences on Cotopaxi, at 1411 toises above the level of the sea; or, by our measure, at the height of about a mile and three quarters ^(t).

Mr. Edens, on the other hand, hath given us a very particular account of what he observed in going to the top of Teneriff ^(u); and so far from seeing snow or ice (except in a cave) his coat was covered, during the night, with dew, at the very summit, which, according to Dr. Heberden's computation, is 15,396 feet high, or wants but 148 yards of three miles ^(x).

Now as it is thus settled, that the Pic of Teneriff is nearly three miles high, which exceeds by more than a mile the height of the freezing point on Cotopaxi, situated under the Equator, it should seem that there is no material difference between the heat under the Equator and within the Tropics; for if it is urged, that Teneriff is more surrounded with sea than Cotopaxi, it must on the other hand be recollected, that this mountain is situated 5 degrees to the Northward of the Tropic, at the same time that the summit exceeds the freezing

F 2

point

(t) Cotopaxi is the highest mountain of the Andes, at least in the neighbourhood of Quito. The plain of Carabuca, from which it rises, is 1023 toises above the level of the sea, and the height of the mountain above this plain is 1268 toises, making together 2291 toises. If 880 toises therefore are deducted from 2291, 1411 toises become the height of the freezing point upon this mountain. See Ulloa's Account of S. America.

(u) Phil. Transf. Abr. vol. V. p. 147. Sprat's Hist. R. Soc.

(x) See Hawkesworth's Voyages, vol. II. p. 12. Goats also reach the very summit, which must be in search of food, as they do not bear cold well.

point on Cotopaxi by more than a mile; both which circumstances should render it colder than the freezing point on Cotopaxi:

The inference to be drawn from this comparison seems to be, that as the heat varies so little between the Equator and the tropical limits, it may differ as little between the Arctic circle and the Pole.

Nothing hath been supposed to shew more strongly the wisdom of a beneficent Creator, than that every part of this globe should (taking the year throughout) have an equal proportion of the Sun's light.

It is admitted, that the equatorial parts have rather too much heat for the comforts of the inhabitants, and those within the Polar circles too little; but as we know that the tropical limits are peopled, it should seem, that the two Polar circles are equally destined for the same purpose; or if not for the benefit of man, at least for the sustenance of certain animals.

The largest of these, in the whole scale of Creation, is the whale; which, though a fish, cannot live long under water, without occasionally raising its head into another element, for the purpose of respiration: most other fish also occasionally approach the surface of the water.

If the ice therefore extends from N. lat. $80\frac{1}{2}$ to the Pole, all the intermediate space is denied to the Spitzbergen whales, as well perhaps as to other fish; and is that glorious luminary, the Sun, to shine in vain for half the year upon ten degrees of latitude round each of the

Poles,

Poles, without contributing either to animal life or vegetation? for neither can take place upon this dreary expanse of ice.

If this tract of sea also is thus rendered improper for the support of whales, these enormous fish, which require so much room, will be confined to two or three degrees of latitude in the neighbourhood of Spitzbergen; for all the Greenland masters agree, that the best fishing stations are from 79 to 80, and that they do not often catch them to the Southward.

I will now ask, if the sea is congealed from N. lat. $80\frac{1}{2}$ quite to the Pole, when did it thus begin to freeze, as it is well known, that a large quantity of sea water is not easily forced to assume the form of ice (y)? Can it be
con-

(y) “ There are three kinds of ice in the Northern seas. The first is like
“ melted snow which is partly hardened, is more easily broken into pieces, less
“ transparent, is seldom more than six inches thick, and when melted, salt is
“ found in it. This first sort of ice is the only one which is ever formed from
“ sea water.

“ If a certain quantity of water, which contains as much salt as sea water,
“ is exposed to the greatest degree of cold, it never becomes firm and pure ice,
“ but resembles tallow, or suet, whilst it preserves the taste of salt, so that the *sweet*
“ transparent ice can never be formed in the sea. If the ice of the sea itself,
“ therefore, confined in a small vessel without any motion, cannot thus become
“ true ice, much less can it do so, in a deep and agitated ocean.” The author
hence infers, “ that all the floating ice in the Polar seas comes from the
“ Tartarian rivers and Groenland,” as I have before contended. See a Dissertation of Michel Lomonosof, translated from the Swedish Transactions of 1752. *Collection Académique*, Tom. XI. p. 5. & seq. Paris, 1772, quarto. The Dissertation is entitled, “ *De l'Origine des Monts de Glace, dans la Mer du Nord.*”

contended, that ten degrees of the globe round each pole, were filled with an incruited sea at the original creation? And if this is not insisted upon, can it be supposed, that when the surface of the Polar ocean first ceased to be liquid, it could have resisted the effects of winds, currents, and tides?

I beg leave also, to rely much upon the necessity of the ice's yielding to the constant reciprocation of the latter; because no sea was ever known to be frozen but the Black Sea, and some small parts of the Baltic^(z), neither of which have any tides^(a), at the same time that the waters of both are known to contain much less salt than those of other seas, from the great influx of many fresh water rivers. For this last reason, it may likewise be presumed, that the circumpolar seas are very salt, because there is probably no such influx beyond N. lat. 80, Spitzbergen itself having no rivers.

Having thus given some general reasons, why the sea should not be supposed to be frozen in the ten highest degrees of latitude, I shall now proceed to lay before the Society, several instances, which I have lately collected, and which prove that it is not so covered with ice considerably to the N. of $80\frac{1}{2}$.

I shall

(z) To these perhaps may be added the White Sea.

(a) The tides indeed do not rise to a great height on the Northern coast of Spitzbergen; but I do not know that it must follow from thence, that they may not be more considerable, as the Pole is approached; at least such an inference is by no means conclusive.

I shall, however, previously make two observations; the first of which is, that every instance of exceeding N. lat. $80\frac{1}{2}$, as much proves that there is no perpetual barrier of ice in that latitude, as if the navigator hath reached the Pole. The second is, that as four experienced Greenland masters have concurred in informing me, that they can see what is called the *blink of the ice*^(b), for a degree before them, they never can be off Hakluyt's Headland, which is situated in $79^{\circ} 50'$, without observing this effect of the ice upon the sky, if there was a perpetual barrier at $80\frac{1}{2}$, which is not much more than half a degree from them, when in that situation. Now Hakluyt's Headland is what they so perpetually take their departures from, that it hath obtained the name of *The Headland* by way of preeminence.

This mountain also is so high, that it can be distinguished at the distance of a degree: in such instances, therefore, which I shall produce, that do not settle the latitude by observation, whenever the reckoning depends upon the approach or departure from this Headland, the account receives the additional check of the mountain's being increased or diminished gradually to the eye of the observer.

My second previous remark shall be, that in all instances of reaching high Northern latitudes, for which the authority of the ship's journal may be required,

(b) This is described to be an arch formed upon the clouds, by reflection from the *packed ice*.

quired, it is almost impossible to procure this sort of evidence, except the voyages have been recent; not only for the reasons I have given in my former paper, but because I find, that if the ship's journal is not wanted by the owners in a year or two (which seldom happens) it is afterwards considered as waste paper.

Without the least impeachment also of the knowledge in navigation of the Greenland masters, when they are in the actual pursuit of fish, they do not trouble themselves about their longitude or latitude; they are not bound by their instructions to sail to any particular point, and their only object is to catch as many whales as possible; the ship's situation therefore, at such time, becomes a matter of perfect indifference. It will appear, however, that they not only keep their reckonings, but observe, when they are not thus employed in fishing.

Having made these previous remarks, I shall now proceed to lay before the Society, such instances of navigators having penetrated beyond $80\frac{1}{2}^{\circ}$, as I have happened to procure since the reading of my former paper on this subject, in May last.

James Hutton (then belonging to the ship London, Captain Guy) was, thirty years ago, in N. lat. $81\frac{1}{2}^{\circ}$, as both the captain and mate informed him; but did not observe himself. A very intelligent sea officer was so good as to take from him this account, together with the following particulars, which perhaps may be interesting to Greenland navigators.

Hutton

Hutton hath been employed in the whale fishery nearly these forty years, during which he hath been several times at the Seven Islands, and the Waygat Straits. In some of these voyages the sea hath been perfectly clear from ice, and at other times it hath set in so rapidly towards the Waygat, as to oblige the vessels which happened to be thereabouts, to force all sail possible, to escape being inclosed.

This hardy old tar likewise supposes, that he hath been further up the Waygat than perhaps any person now living; for he was once in a ship which attempted to pass through it, nor did the master desist, till they shoaled the water to three fathoms, when the sea was so clear, that they could distinguish the bottom from the deck.

Mr. John Phillips, now master of the Exeter, but then mate of the Loyal Club, in the year 1752, reached N. lat. 81 and several minutes by observation, which circumstance was confirmed by another person on board the Exeter last summer, on her return from the Greenland fishery. Captain Phillips added, that it was *very common* to fish in such latitudes.

Mr. George Ware, now living at Erith in Kent, served as chief mate in the year 1754, on board the Sea Nymph, Captain James Wilson, when, at the latter end of June, they sailed through floating ice from 74 to 81; but having then proceeded beyond the ice, they pursued the whales to 82° 15', which latitude was determined by Mr. Ware's own observation.

As the sea was now perfectly clear, as far as he could distinguish with his best glasses, both Mr. Ware and Captain Wilson had a strong inclination to push further towards the Pole; but the common sailors hearing of such their intention, remonstrated, that if they should be able to proceed so far, the ship would fall into pieces, as the Pole would draw all the iron work out of her.

On this Captain Wilson and Mr. Ware desisted, as the crew had these very singular apprehensions; especially as they had no whales in sight to the Northward, which alone would justify the attempt to their owners^(c). It need scarcely be observed, however, that the notion which prevailed amongst the crew shews, that the common seamen on board the Greenland ships conceive, that the sea is open to the Pole; they would otherwise have objected on account of the ice being supposed to increase. It should seem also, that the practicability of reaching the Pole is a point which they often discuss amongst themselves.

In *this same year and month*, Mr. John Adams (who now is master of a flourishing academy at Waltham Abbey, in Essex) was on board the Unicorn, Captain Guy, when they anchored in Magdalena Bay^(d), on the Western coast of Spitzbergen and N. lat. $79^{\circ} 35'$. They

(c) This circumstance of not seeing any whales to the Northward, accounts for Captain Guy's desisting, in the following instance, from sailing to the Northward, as also in many others which I shall have occasion to state.

(d) The Greenland masters most commonly call this bay Mac-Helena.

They continued in this bay for three or four days, and then stood to the Southward, when the wind freshening from that quarter, but the weather foggy, they proceeded with an easy sail for four days, expecting to meet with fields of ice, to which they might make fast; but they did not encounter so much as a piece of floating ice. On the fifth day the wind veered to the Westward, the weather cleared up, and Mr. Adams had a good observation (the Sun above the Pole^(e)) by which he found himself three degrees to the Northward of Hakluyt's Headland, or in N. lat. 83.

Captain Guy now declared, that he had never been so far to the Northward before, and crawled up to the main-top mast head, accompanied by the chief mate, whilst the second mate together with Mr. Adams went to the fore-top mast head, from whence they saw a sea as free from ice as any part of the Atlantic ocean, and it was the joint opinion of them all, that they might have reached the N. Pole.

The ship then stood to the Southward, and twelve hours afterwards Mr. Adams had a second good observation (the Sun beneath the Pole) when their latitude was $82^{\circ} 3'$. In both these observations, Mr. Adams made an allowance of $5'$ for the refraction, which, he says, was his captain's rule, who was now on his 59th or 60th voyage to the Greenland seas.

(e) The old navigators to these parts call this a *South Sun*.

In the year 1756, Mr. James Montgomery, now a merchant in Prescot-street, Goodman's-fields, but then master of the Providence, followed the whales during the month of June till he reached N. lat. 83, by observation. Another Greenland master informs me, that he remembers well the ice packed much to the Westward, but that the sea was open to the Northward during that summer.

In 1762, David Boyd, then mate of the brig Betfy, was driven by a gale of wind from 79 to 82, odd minutes, by observation; during all which time he was beset in ice. A Greenland master has likewise told me, that he recollects many other ships were driven to the N. E. from their fishing stations during that season.

Mr. Jonathan Wheatley, now master of a Greenland ship, was in 1766 off Hakluyt's Headland^(f), whence, not meeting with success, he sailed N. W. to $81\frac{1}{2}$, in which latitude he could see no ice in any direction whatsoever from the mast head, though there was a very heavy sea from the N. E.

Mr. Wheatley also informs me, that whilst he was off the Coast of Greenland, three Dutch Captains told him, that a ship of their nation had been in 89, and they all supposed, that the sea in such a latitude might be as free from ice as where they were fishing. This account probably alludes to the Dutch man of war on board of which Dr. Daillie happened to be, the circumstances

(f) He was then on board a ship called the Grampus

cumstances of which voyage I have stated in my former paper,

This same captain is so thoroughly persuaded of being able to approach the Pole, that he will attempt it whenever an opportunity offers of doing it, without prejudice to his owners. On such a voyage of discovery, he would not wish a larger vessel than one of 90 tons, nor more than ten hands. I find, indeed, that this is the size of the ship, in which most of the early navigators attempted to penetrate far to the Northward.

In 1769, Mr. John Thew, now master of a Greenland ship called the Rising Sun, was in N. lat. 82, and 100 leagues to the W. of Hakluyt's Headland. The circumstances by which he supposed himself to have been in this situation, were stated to me in the presence of a very able sea officer, who told me afterwards, that he was perfectly satisfied with the accuracy of his account.

Captain John Clarke, of the Sea Horse, at the latter end of June 1773, sailed from the Headland N. N. E. to $81\frac{1}{2}$, which he computed by his run from the Headland in 18 hours, having lost sight of it. At this time there was an open sea to the Northward, and such a swell from the N. E. that the ship would not stay, being under her double reef'd topails, whilst the wind blew fresh.

During this run from the Headland, Mr. Clarke fell in with Captain Robinson in $81^{\circ} 20'$, whom I mentioned in my former paper as having reached 81° in the same month and year, by a very accurate observation.

This

This same Captain Robinson, on the 28th of June last, passed by Hakluyt's Headland, lying off and on for several days, during which he was sometimes a degree to the Northward of it, and till the 20th of July following, there was no obstruction to his proceeding Northward; to which, however, he had no inducement, as he caught two large whales in this latitude.

Captain John Reed, of the Rockingham, also in July last, pursued some whales 15 leagues to the Northward of the Headland, and confirms Captain Robinson's last account, by saying, he could then see no ice from his mast head.

Captain Reed was brought up in the Greenland fishery, and remembers well, that whilst on board his father's ship, the Thistle, the mate told him, that they had reached $81^{\circ} 42'$, when there was indeed a good deal of ice, but full room to sail in any direction.

Mr. Reed likewise hath informed me, that about 15 years ago, a Dutch Captain (whose name was Hans Derrick) told him, whilst they were together in the Greenland seas, that he had been in N. lat. 86, when there were only some small pieces of floating ice to be seen. Hans Derrick moreover added, that there were then five other ships in company, which took one with another eighteen small whales.

Mr. Reed supposes, that this Dutch master may be still living, and I shall, therefore, endeavour to procure further intelligence about this Greenland voyage from

Holland; at all events, the account is so circumstantial, that it seems well to deserve attention.

I have great reason to expect several other instances of the same kind, in a short time, from the different ports of this kingdom where there is any considerable Greenland trade: I shall not, however, trouble the Society with them, till I know whether they would wish any further information on this head.

I shall now recapitulate the different latitudes which have been reached by the several navigators whose names I have mentioned in this and my former paper. I shall also take credit for nearly a degree to the Northward of their several situations, because the *blink or glare* of the *packed ice* is to be distinguished at this distance, when the weather is tolerably fair,

80°. 45'. Captain John Reed.

81°. For three weeks together, Captain Thomas Robinson.

81°. odd minutes. Captain John Phillips.

81°. 30'. Four instances; *viz.* James Hutton, Jonathan Wheatley, Thomas Robinson, John Clark.

82°. Two instances; *viz.* Captains Cheyne and Thew.

82°. odd minutes. Two instances; *viz.* Cluny and David Boyd.

82°. 15'. Mr. George Ware.

83°. Two instances; Mr. John Adams and Mr. James Montgomery.

83°. 30'. Mr. James Watt, lieutenant in the royal navy.

86°. Five

86°. Five ships in company with Hans Derrick.

88°. Two instances; Captain Johnson and Dr. Daillie;
to which, perhaps, may be added Captain Monson as
a third.

89°. Relation of the two Dutch ships to Captain
Goulden^(g).

89°. 30'. Dutch relation to Mr. Grey.

DAINES BARRINGTON, F.R.S.

(g) This instance, however, hath before been relied upon, though never,
perhaps, circumstantially stated, but by Captain Wood.

P O S T S C R I P T.

January 8, 1775.

HAVING procured the three following instances before the reading of my paper was finished, it may not be improper to add them in a postscript.

In Harris's Voyages ^(b) is the following passage, "By the Dutch Journals they get into N. lat. 88° 56', and the sea open."

I have within these few days, asked Dr. Campbell, the very able compiler of these voyages, upon what authority he inserted this account? Who informs me, that he received it from Holland about 30 years ago, as being an extract from the journals produced to the States General in 1665, on the application for a discovery of the N. E. passage to Japan, which was frustrated by the Dutch East India Company.

In the *Journal des Sçavans*, for the month of October 1774 ⁽ⁱ⁾, is likewise the following paragraph:

"To these instances produced by Mr. Barrington [of navigators having reached high Northern latitudes], our countrymen (*viz.* the Dutch) could add many others. An able officer in the English service, hath in his custody, the journals of a Greenland ship, wherein
" he

(b) Vol. II. p. 453.

(i) Part. II. p. 503.

“ he hath remarked, that in the month of May he had
 “ penetrated as far as $82^{\circ} 20'$, when the sea was open.”

The same journalist confirms what I have before mentioned, that Monf. de Bougainville will try to reach the Pole^(k).

My third and last instance is that of Captain Batefon, who failed in 1773, from Liverpool, in a ship called the Whale, on the Greenland fishery, and who, on June 14, reached N. lat. $82^{\circ} 15'$, computed by his run-back to Hakluyt's Headland^(l). As this happened so recently, Captain Batefon (as well as many of the other masters, whose accounts I have before mentioned) hath his journal to produce, if it should be required.

This seems to be the strongest confirmation of both Captain Robinson and Captain Clark's having been, during this same year and month, in $81\frac{1}{2}$; as also of their having met each other in $81^{\circ} 20'$, according to what I have already stated.

I must not lose this same opportunity of laying before the Society, the information which I have just now received from M. de Buffon, in relation to what I have cited from his Natural History of Captain Monfon's having reached N. lat. 88° , “ *as he was told by persons of credit.*”

Upon

(k) Ibid. p. 506.

(l) His inducement to proceed so far North, was the pursuit of whales. I have shewn the extracts from Captain Batefon's journal to a very able sea officer, who is perfectly satisfied with the accuracy of it.

Upon my taking the liberty to inquire, *who those persons of credit were?* Monf. de Buffon refers me to Dr. Nathan Hickman, who in 1730 travelled as one of Dr. Ratcliff's fellows^(m); and who supposed, that Captain Monson's journal might have been at that time procured in England. Monf. de Buffon also recollects, that a Dutchman was then present, and confirmed the account.

(m) He was also a fellow of the Royal Society in 1730.



ADDITIONAL PAPERS

FROM

H U L L.

WHILST I was waiting in expectation of several additional instances of Dutch ships, which had been in high Northern latitudes, I received the following answers to certain queries, relative to the Greenland seas, from a very eminent merchant of Hull, and which he is so obliging as to permit me to lay before the public. March 31, 1775. D. B.

I. From Captain JOHN HALL of the *King of Prussia*.

Answer to 1st Query, *viz.* How near hath any ship approached the Pole?

I have known ships go into the latitude of 84° North, and did not hear of any difficulty they met with; but it is not often that the ice will permit them to go so far North.

N. B. On enquiring of Captain Hall what ships he had known penetrate so far? He replied, they were some Dutch ships he heard had done so, but knew no particulars.

2d Query. When are the Polar seas most free from ice? The

The seas are most incumbered with ice from about the 1st of September to the 1st of June following; and in consequence, between the 1st of June and September, the ice lyeth furthest from Spitzbergen. And I know no other precaution to be taken respecting the Pole, than that they must watch the opportunity when the ice lyeth furthest from the land.

3d Query. How far to the Southward have you first seen ice?

In the space of twenty years I have twice known, that we met with the ice in the latitude of $74^{\circ} 30'$ North, and could not find a passage to the Northward till the month of July, and then got into the latitude of 78° with much difficulty, in running through the openings of great bodies of ice; and some years we find a passage to the latitudes 79 and 80° North, without much difficulty from the ice. Some years I have known ships go round the North part of Spitzbergen, between thence and the North-east, and so come out between Nova Zembla and the South part of Spitzbergen; but this passage is seldom to be found free from ice.

4th Query. From what quarter is the wind coldest whilst off Spitzbergen?

Northerly and E.N.E. winds are most frosty; but snow and frost we have very common with all winds, except part of June, July, and August. If the winds be Southerly the weather is milder, but subject to snow, fleet, and thick weather. The winds, currents, and the ice being so variable, I cannot form any judgement of the time when they may be expected. The

The opinion of the old seamen is, that we may proceed further North than ever has been yet attempted; but this must be done with caution. An opportunity is to be watched for in those seas. The most likely time for such discoveries to be made, is in the months of July and August, when the ice is most commonly furthest from the land; but some years not to be found open at all from the land. And when it is open, they must observe the ice must lay a long way from the North part of Spitzbergen; for I have known ships that made attempts to go to the Northward, and before they returned back, the ice set in with the land, so that they have been obliged to leave the ships to the East of Spitzbergen.

N. B. The ice always sets in with the land the back of the year.

II. From Captain HUMPHRY FORD of the *Manchester*.

Ist. I was once as high as the latitude $81^{\circ} 30'$ North, in the ship Dolphin of Newcastle, in the year 1759 or 60, and have been several times since as high as the latitude 81° , in the ships Annabella and Manchester, in which latitude I never met with any uncommon circumstances, but such as I have met with in the latitudes 75, 76, 77, 78, and 79° ; if to the westward, I was commonly incumbered with large quantities of ice.

2d. I suppose that the Greenland seas are most incumbered with ice in the months of December, January, February, and March; for in the latter part of April and the first of May the ice generally begins to separate and open; and in the months of June and July, we generally find the Greenland seas most clear of ice.

3d. The only precaution to be taken, in order to proceed towards the Pole, is to fit out two strong ships that are handy and sail fast, well equipped, and secured in the manner of those that are generally sent to Greenland on the whale fishery. Such ships should be manned with about forty able seamen in each, and victualled for eighteen months or two years, and be entirely under the command of some expert, able, and experienced seaman, who has frequented those seas for some time past. They should sail from England about the middle of April, in order to be in with the edge of the ice about the 10th of May, when it begins to separate and open.

4th. There is not the least reason to suppose, that the seas to the West, North-west, and North of Spitzbergen are covered with permanent and perpetual ice, so as never to be opened by the operation of the winds; for daily experience shews us, that a Northerly wind, when of any long duration, opens and separates the ice, so as to admit of ships going amongst it in sundry places to a very high latitude, if attempted.

N. B. I never was to the Eastward of Spitzbergen; but am of opinion, that the ice is much the same there

there as to the North and North-west of Spitzbergen.

I generally find that Northerly winds bring frost and snow; on the contrary, Southerly winds bring mild weather and rain; but none of those winds appear to be periodical, except close in with the land, called Fair Foreland, where I generally find the winds in the months of June and July to blow mostly from the S. S. W. and very often excessive strong.

It is my opinion, by observing the above, that in some years ships might penetrate very nigh the Pole; if not, the impracticability must arise from the large quantity of ice that lies in those seas.

III. From Captain RALPH DALE of the *Ann and Elizabeth.*

I am willing to give you my opinion, in regard to the queries received of you, so far as my observations will justify.

1st. In the year 1773, I sailed North 81° , when I was much incommoded with large fields of ice, but the air was not sensibly different there from what I found it a few more degrees Southerly.

2d. I have for many years used the Greenland fishery; and have, by experience, found those seas the least encumbered with ice betwixt the forepart of May till July.

3d. The

4th. I have observed, that let the wind blow from what quarter it will, it is at times impregnated with frost, snow, &c.; but when most so I am not able to determine. As for rain, I do not recollect ever seeing any there. The weather I have generally found mildest when the wind blows Southerly. As for periodical winds, I do not suppose there are any in Greenland.

IV. From Captain JOHN GREENSHAW.

In regard to the Queries sent to me, all I have to say is, that if a passage to the North Pole is ever to be accomplished, my opinion is, it must be obtained by going betwixt Greenland and Nova Zembla, as I myself have been to the Westward of Greenland, and penetrated so far to the Northward as 82° of North latitude, and to the North and North-west of that found nothing but a solid body of ice: my opinion, therefore, is, that it is impossible ever to obtain a passage that way. Captain John Cracoft, in the South Sea Company's time, was once so far as 83° North latitude, and to the Northward of Greenland, and met with nothing but a

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solid

solid field of ice. And in regard to the winds and weather, it freezes continually; but the wind from the Southward doth commonly bring rain and thick foggy weather, which is chiefly in the latter end of June and July. If you are to the Northward and Westward of Greenland, the wind from the N.W. and N.N.W. doth always open the ice; but at the same time, if it come to blow any time from that quarter, packs it close in with the land; and the winds from the Southward have the contrary effect.

V.

The Queries answered by ANDREW FISHER, master of a Greenland ship at Hull, who has been twenty-four voyages from England to the Greenland seas.

1st. Said Andrew Fisher says, that in the year 1746, being on board the ship Ann and Elizabeth from London, on a voyage to the Greenland seas, he steered from Hakluyt's Headland in Spitzbergen North and N.N.W. in clear water till they were in latitude $82^{\circ} 34'$; where they met with a loose pack of ice, and made their fishery, or otherwise they might have got through that loose ice, and doubt not, but that they might have gone considerably further North; they returned, however, in clear water to Spitzbergen.

2d. Best seasons of the year are, to be at or near Spitzbergen from the 15th of May to the 1st of June, though the years differ, and the laying of the ice exceedingly; some years it is not possible to get North of 80° ,

80°; at other times you may meet with very little ice, which is chiefly owing to the weather in winter, and the winds in April and May.

3d. There is not any reason to suppose, that there is any permanent ice, either North or West of Spitzbergen, so far as 90°; and it hath been always found, by able and experienced navigators, that there is not near the quantity of ice, nor so liable to set fast to the North of Spitzbergen as there is to the South of 80° as far as 74°, owing to the continent of America (called Gallampus land by the sailors and Spitzbergen), which makes a narrow passage in proportion to what it is to the North of Spitzbergen. The land of America is sometimes seen by our Greenland traders from latitude 74° to 76°, and as it is not seen any further North, is supposed to round away to the North-west, which makes it imagined by many, that there is not any land near the Pole.

4. South winds bring most snow; North winds bring frost; but that is in the month of April and two-thirds of May; after that time, to the 1st or 10th of July, it is in general mild, fine, clear, sun-shine weather, and winds variable; after that again, often thick fogs and high winds.

5. It is very possible, by steering North or N. N. E. by the ship's compass, (if it can be so contrived as to have the card on the needle steady, and the winds prove favourable,) with a little perseverance, a ship may get near the Pole, if they do not meet with rocks.

VI.

S I R,

IN the year 1766, trade being dull, I fitted a ship at my sole expence, to the Greenland seas; and the said ship returned with one fish, eleven feet bone. Finding the trade could be conducted better in private hands than a company's, I was induced to send a second ship in 1767, and as I had other concerns in shipping, thought it most prudent (being brought up to the sea, and having made an easy fortune from it) to go a voyage to the Greenland seas, to see with my own eyes what chance there might be of making or losing a fortune. So sailed from Hull the 14th day of April, in my ship the British Queen, with an old experienced master, and on the 24th and 25th of April was in the latitude of 72° , catching seals amongst great quantities of loose ice. As we did not choose to stay in that latitude, we made the best of our way North; and after sailing through loose ice, which is commonly the case, about the 6th of May we were as far North as latitude 80° , (which is near what the masters call *a fishing latitude*) and about 15 leagues West of Hakluyt's Headland. I found the further North the less quantity of ice; and from the enquiry I made, both from the English and Dutch, which was very considerable, there is a great probability of ships going to the Pole, if not stopped by meeting land or rocks. It appeared to me, that the narrowest place

in those seas was betwixt Spitzbergen and the American shore, where the current is observed to come always from the North, which fills this narrow place with ice, but in general loose and floating in the summer, though I believe congealed and permanent in winter. Those from whom I enquired informed me, that the sea was abundantly clearer to the North of Spitzbergen, and the further North the clearer. This seems to prove a wide ocean and a great opening to the North, as the current comes from thence that fills this passage as aforesaid. The best method of reaching the highest latitude in my opinion is, to hire two vessels of about 250 tons burthen each, and if done on a frugal scheme, the same ships might be fitted for the whale fishery, and premiums given both for the use of the ship and crew, in proportion to their approach to the Pole, which, from many circumstances that may intervene, might be two or three years before they could complete their wishes. And it is more likely they might make their fishery sooner than to the Southward; as, if they met with ice, the fish would be undisturbed; if clear water and a good wind, they very soon might reach the Pole. What I mean by two vessels is, one to forefail the other at the distance of three or four leagues, as the latter may avoid the dangers the first might run into; and to be always ready, on seeing and hearing proper signals, to aid and assist, and by that means secure a retreat. I am also of opinion, that such ships being sent on discoveries are much more likely to

succeed

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succeed than his majesty's ships and officers. The above hints I have pointed out for your consideration, and if I can be of any further service, may command,

Sir, your most humble servant,

Hull,
March 4, 1775.

SAM. STANDIDGE.



AS it appears, by the two first collections of instances, that I have had much conversation with the officers of the royal navy, as well as masters of Greenland ships, about a Polar voyage, I shall now state several hints which have occasionally dropped from them, with regard to prosecuting discoveries to the Northward.

The ship should be such as is commonly used in the Greenland fishery, or rather of a smaller size, as it works the more readily when the ice begins to pack round it.

There should, on no account, be a larger complement of men than can be conveniently stowed in the boats, as it sometimes happens, that the Greenland vessels are lost in the ice; but the crews generally escape by means of their boats. The crew also should consist of a larger proportion of smiths and carpenters than are usually put on board common ships.

As it may happen, that the crews in boats may be kept a considerable time before they can reach either ship or shore, there should be a sort of awning, to be used

used occasionally, if the weather should prove very inclement.

As it is not wanted that the boats should last many years, it is advised, that they should be built of the lightest materials, as on this account they are more easily dragged over the packed ice.

As it is possible also, that the crew may be obliged to winter within the Arctic circle, it is recommended, that the ship should be ballasted with coals.

That there should be a framed house of wood on board, to be made as long as possible, for the opportunity of exercise within doors^(a).

That there should be a Russian stove on board, as a fire in a common chimney does not warm the room equally.

It appears, by the accounts of the Dutch who wintered in Nova Zembla, as well as the Russians who continued six years in Maloy-Brun, that during this season there are sometimes days of a tolerable temperature; snow shoes, therefore, should be provided, as also snow eyes, not to lose the benefit of air and exercise during such an interval. The beard likewise should be suffered to grow on the approach of winter, from which the Russian couriers are enabled to support the severity of the open air. Russian

(a) On the Labradore Coast the furriers raise a wall of earth all round their huts, as high as the roof, which is found to contribute much to warmth within doors, so as to want little more heat than arises from the steam of lamps. Such wall is commonly three feet thick.

Russian boots, and the winter cap of the furriers of North America, is also recommended; but recourse should not be had to this warmest cloathing upon the first approach of winter, for by these means the Russians do not commonly endure cold so well as the English; because when the weather becomes excessively severe, they cannot well add to their warmth.

When the weather is very inclement, leads for the hands, dumb bells, and other such exercises should be contrived for within-doors.

In order to prevent the scurvy likewise, frequent use of the flesh-brush is recommended, as also occasionally a warm bath, from which James's crew received great benefit, when they wintered on Charlton Island.

With regard to the provisions, I shall here insert a method of curing meat, communicated to me by Admiral Sir Charles Knowles, the good effects of which both himself and others have frequently experienced^(b).

The

(b) So soon as the ox is killed, let it be skinned and cut up into pieces fit for use, as quick as possible, and salted whilst the meat is hot; for which purpose, have a sufficient quantity of salt-petre and bay-salt pounded together, and made hot in an oven, of each equal parts; with this sprinkle the meat, at the rate of about two ounces to the pound. Then lay the pieces on shelving boards to drain for 24 hours; which done, turn them and repeat the same operation, and let them lay for 24 hours longer, by which time the salt will be all melted, and have penetrated the meat, and the juices be drained off. Each piece must then be wiped dry with clean coarse cloths, and a sufficient quantity of common salt, made hot likewise in an oven, and mixed (when taken out) with about one-third brown sugar. The casks being ready, rub each piece well with

The flour should be kiln-dried, and put into tight barrels which are capable of holding liquids. Flour thus preserved and packed hath been perfectly good for more than three years, without the least appearance of the weevils.

To make the best use of flour thus preserved, there should be both a biscuit-maker and an oven on board.

With regard to liquors, a large quantity of shrub from the best spirits and fruits is recommended, which should also be made just before the voyage takes place; the stronger the spirit, the less stowage.

I should stand in need of many apologies, for having suggested these hints to Northern discoverers, had I not received them from officers of the royal navy, as well as Greenland masters and physicians; if any one of these particulars, however, would not have been otherwise thought of upon fitting out the ship for such a voyage, and should be attended with any good effects, it will become my best excuse.

In order also to promote such a voyage of discovery, I should conceive, that extending the parliamentary reward of twenty thousand pounds by 18 G. II. c. 17.

for

with this mixture, and pack them well down, allowing about half a pound of the salt and sugar to each pound of meat, and it will keep good several years.

N. B. It is best to proportion the casks or barrels to the quantity consumed at a time, as the seldomer it is exposed to the air the better. The same process does for pork, only a larger quantity of salt, and less sugar; but the preservation of both equally depends on the meat's being hot when first salted.

for the passage to the Pacific Ocean through Hudson's Bay, to a Northern communication between the Atlantic and Pacific Oceans in any direction whatsoever, might greatly contribute to the attempting such an enterprize.

To this, another incitement might be perhaps added, by giving one thousand pounds for every degree of Northern latitude which might be reached by the adventurer from 85° to the Pole, as some so very peremptorily deny all former instances of having reached such high latitudes.

I shall conclude, however, in answer to their incredulity, by the following citation from Hakluyt:

“ Now least you should make small account of
 “ ancient writers, or of their experience, which tra-
 “ velled before our times, reckoning their authority
 “ amongst fables of no importance, I have, for the
 “ better assurance of those proofs, set down part of a
 “ discourse written in the Saxon tongue, and translated
 “ into English by M. Nowel, servant to master secre-
 “ tary Cecil, wherein is described a navigation, which
 “ one Ochter made in the time of king Alfred, king of
 “ West Saxe, anno 871; the words of which discourse
 “ are these: ‘ He sailed right North, having always the
 “ desert land on the starboard, and on the larboard the
 “ main sea, continuing his course until he perceived
 “ the coast bowed directly towards the east, &c.’
 “ Whereby it appeareth, that he went the same way
 “ that we do now yearly trade by St. Nicholas into
 “ Moscovia, which no man in our age knew for cer-
 “ tainty

“ tainty to be sea, till it was again discovered by the
 “ English in the time of Edward VI.

“ Nevertheless, if any man should have taken this
 “ voyage in hand, by the encouragement of this only
 “ author, he should have been thought but simple,
 “ considering that this navigation was written so many
 “ years past, in so barbarous a tongue, by one only
 “ obscure author; and yet, in these our days, we find
 “ by our own experience, his reports to be true.”

THOUGHTS

ON THE

PROBABILITY, EXPEDIENCY, AND UTILITY

OF

DISCOVERING A PASSAGE

BY THE

NORTH POLE.

THE HISTORY OF

ON THE

PROBABILITY, EXPEDIENTY, AND UTILITY

BY THE

OF RICHARD



THOUGHTS, &c. (*)

THE possibility of making discoveries in this way (that is, by steering directly North) though now treated as paradoxical by many, was not, as will hereafter appear, formerly looked upon in that light, even by such as ought to be reputed the properest judges. There have been a variety of causes that at different times have retarded undertakings of the utmost importance to the human species. Amongst these we may justly consider the conduct of some great philosophers, who, as our judicious Verulam wisely observes, quitting the luminous path of experience to investigate the operations of nature, by their own speculations, imposed upon the bulk of mankind specious opinions for incontestable truths; which being propagated by their disciples, through a long series of years, captivated the minds of men, and thereby deprived them of that great instru-

(*) I have lately received these reflections from a learned friend, who permits me to print them, though not to inform the public to whom they are indebted for this very valuable communication. D. B.

instrument of science, the spirit of enquiry^(a). In succeeding ages a new impediment arose from the setting up profit as the ultimate object of discovery; and then, as might well be expected, the preferring the private and particular gain of certain individuals to the general interests of the community, as well as to the interest of the whole world, in the extension of science. This it was that induced the States General, at the instance of their East India Company, to discourage all attempts for finding a North East passage, and to stifle such accounts as tended to shew that it was practicable. We may add to these, the journeys of disappointed navigators who endeavoured to render their own miscarriages proofs of the impracticability of any like attempts. This was the case of Captain Wood, who was shipwrecked upon Nova Zembla, and who declared, that all endeavours on that side were, and would be, found vain; though Barentz, who died there in a like expedition, affirmed, with his last breath, that, in his own opinion, such a passage might be found.

That the earth was spherical in its form, was an opinion very early entertained, and amongst the learned generally admitted. It seemed to be a plain deduction from thence, that a right line, passing through the globe, would terminate in two points diametrically opposite. Plato is thought to be the first who spoke of the inhabitants

(a) Baconi Opera, tom. IV. p. 100. *et alibi passim*. But these passages may be found collected in Shaw's Abridgement of Bacon's Works, vol. II. p. 52.

inhabitants (if such there were) dwelling at or near those points, by the name of Antipodes. This doctrine occasioned disputes amongst philosophers for many ages; some maintained, some denied, and some treated it as absurd, ridiculous, and impossible^(b). Whoever will examine impartially the sentiments of these great men, weigh the contrariety of their opinions, and consider the singularity of their reasonings, will see and be convinced how unsatisfactory their notions were, and discover from thence, how insufficient the subtle speculations of the human understanding are towards settling points like these, when totally unassisted by the lights of observation and actual experience.

The division of the globe by zones being agreeable to nature, the ancients distinguished them very properly and accurately into two frigid, between the Poles, the Arctic and Antarctic circles; two temperate, lying between those circles and the tropics; and the torrid zone within the tropics, equally divided by the equinoctial. But judging from their experience, of the nature of the climates at the extremities of the zone which they inhabited, they concluded, that the frigid zones were utterly uninhabitable from cold, and the torrid from intolerable heat of the Sun. Pliny laments very pathetically upon this supposition, that the race of mankind

(b) Lucr. de Natura Rerum, lib. I. ver. 1063. Cicer. Acad. Quæst. lib. IV. Plin. Hist. Natural. lib. II. cap. 65. Plutarch. de Facie in Orbe Lunæ. Macrobi. de Somn. Scip. lib. II.

kind were pent up in so small a part of the earth. The poets, who were also no despicable philosophers, heightened the horrors of these inhospitable regions by all the colouring of a warm and heated imagination^(c); but we now know, with the utmost certainty, that they were entirely mistaken as to both. For within the Arctic circle there are countries inhabited as high nearly as we have discovered; and, if we may confide in the relations of those who have been nearest the Pole, the heat there is very considerable, in respect to which our own navigators and the Dutch perfectly agree. In regard to the torrid zone, we have now not the least doubt of its being thoroughly inhabited; and which, is more wonderful, that the climates are very different there, according to the circumstances of their situation. In Ethiopia, Arabia, and the Moluccas, exceedingly hot; but in the plains of Peru (and particularly at Quito) perfectly temperate, so that the inhabitants never change their cloaths in any season of the year. The sentiments of the ancients therefore in this respect, are a proof how inadequate the faculties of the human mind are to discussions of this nature, when unassisted by facts.

The

(c) Cicero in Somnium Scipionis. Virgil. Georg. lib. I. Ovidii Met. lib. I. Tibullus Panegy. ad Messalam, lib. IV. Plin. Hist. Natural. lib. II. cap. 68. Pomp. Mela de Situ Orbis, lib. I. cap. 1. Claudian. de Raptu Proserpinæ, lib. I.

The Pythagorean system of the universe revised, and restored near two hundred and fifty years ago by the celebrated Copernicus, met with a very difficult and slow reception, not only from the bulk of mankind, for that might have been well expected, but even from the learned; and some very able astronomers attempted to overturn and refute it^(d). Galileo Galilei wrote an admirable treatise in its support, in which he very fully removed most of the popular objections. This, however, exposed him to the rigour of the inquisition, and he was obliged to abjure the doctrine of the earth's motion. Our noble philosopher, the deep and acute Lord Verulam, could not absolutely confide in the truth and certainty of the Copernican system; but seems to think, that its facilitating astronomical calculations was its principal recommendation, as if this had not been also a very strong presumption at least, if not a proof of its veracity^(f). It was from this consideration

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that

(d) Amongst the most considerable of these was John Baptist Riccioli, who published his *Almagestum Novum* with this view. Yet afterwards in his *Astronomia Reformata*, he found himself obliged to have recourse to the doctrine of the earth's motion, that he might be able to give his calculations with a proper degree of exactness.

(e) This celebrated work of his was entitled, *Dialoghi de Sistemi di Tolomeo e di Copernico*. This is much better known to the learned world by a Latin translation, which so clearly proved the superiority of the Copernican system, that the only means of refuting it was by the censures of the church.

(f) Shaw's Abridgment of Bacon's Works, vol. II, p. 21. where the doctor endeavours to defend this opinion.

that the church of Rome at length thought fit so far to relax in her decisions, as to permit the maintaining the earth's motion in physical and philosophical disquisitions. But Sir Isaac Newton, who built upon this basis his experimental philosophy, hath dispersed all doubts on this subject, and shewn how the most sublime discoveries may be made by the reciprocal aids of sagacity and observation. On these grounds, therefore, all enquiries of this nature ought to proceed, without paying an implicit submission to the mere speculative notions even of the greatest men; but pursuing steadily the path of truth, under the direction of the light of experience.

It may be urged, in excuse of the ancients, and even of our ancestors in former times, that as they were unassisted by facts, they could only employ guess and conjecture, and that consequently their conclusions were from thence erroneous. But to wave the visible impropriety of deciding in points (where observation was so obviously necessary) without its direction; let us see whether this plea of alleviation may not be controverted in both cases. Cornelius Nepos reports, that some Indians being cast on shore in Germany, were sent by a prince of the Suevi to Quintus Metellus Celer, then the Roman proconsul in Gaul^(g). A very learned writer in discussing this point hath shewn, that it was possible for these Indians to have come by two different routs into the Baltic. He thinks, however, that it is very

(g) Plin. Hist. Nat. lib. II. cap. 67.

very improbable they came by either, and supposes that they were either Norwegians, or some other wild people to whom, from their savage appearance, they gave the name of Indians^(b). But though this observation may well enough apply to the Romans, who at that time had no knowledge of these Northern people, yet it is not easy to conceive, that the Suevi could fall into this mistake; or if they did not, that they should attempt to impose upon the Romans. It appears incontestably, that in the time of king Alfred, the Northern seas were constantly navigated upon the same motives they are now; that is, for the sake of catching whales and sea-horses⁽ⁱ⁾. Nicholas of Lynn, a Carmelite friar, sailed to the most distant islands in the North, and even as high as the Pole. He dedicated an account of his discoveries to King Edward the Third, and was certainly a person of great learning and an able astronomer^(k), if we may believe the celebrated Chaucer, who, in his Treatise on the Astrolabe, mentions him with great respect.

After

(b) Huet Histoire de Commerce et de la Navigation des Anciens, p. 351.

(i) See Barrington's Translation of Orosius from the Anglo-Saxon of king Ælfred, part II. p. 9.

(k) Leland, Comment. de Script. Britan. cap. 370. Bale, vi. 25. Pitts, p. 505. His description was intituled *Inventio Fortunata*; besides which, he wrote, amongst other things, a book, *De Mundi Revolutione*, which possibly may still remain in the Bodleian Library. This friar, as Dr. Dee asserts, made five voyages into these Northern parts, and left an account of his discoveries from the latitude of 54° to the Pole.

After Columbus discovered America under the auspices of Ferdinand and Isabella, the sovereigns of Europe, and especially Henry the Seventh, turned their thoughts towards, and gave great encouragement to discoveries. Mr. Robert Thorne, who resided many years as a merchant in Spain, and who was afterwards mayor of Bristol, wrote a letter to Henry the Eighth, in which he strongly recommended a voyage to the North Pole. He gave his reasons more at large in a long memorial to our ambassador in Spain, which shew him to have been a very judicious man, and for those times a very able cosmographer, and accompanied this memorial with a map of the world, to shew the practicability of his proposal⁽¹⁾. Though this project of his was not attended to, yet a variety of expeditions were made for discovering a passage by the North-west, and others by the North-east, into the South Seas on the one side, and into the Tartarian Ocean on the other, until at length both were declared impracticable by Captain James and Captain Wood; soured by their own miscarriages, and being strongly persuaded, that as they did not succeed, none else could. But even these unsuccessful voyages were not unprofitable to the nation upon the whole, as they opened a passage to many lucrative fisheries, such as those in Davis's Straits, Baffin's

(1) Hakluyt's Voyages, vol. I. p. 212—220. The letter to Dr. Ley, who was the king's ambassador in Spain, is dated *A. D.* 1527. This Mr. Thorne's father was engaged, with others, in the discovery of Newfoundland.

Baffin's Bay, and on the Coast of Spitzbergen. Besides this, they laid open Hudson's Straits and Bay with the Coasts on both sides, which have been already productive of many advantages, and which, in process of time, cannot fail of producing more, in consequence of our being in possession of Canada, and being thereby sole master of those seas and coasts.

It is, however, very remarkable, that notwithstanding the views, both of our traders and of such great men as were distinguished encouragers of discoveries, the ablest seamen (who without doubt are the best judges) were still inclined to this passage by the North, such as Captain Poole, Sir William Monson^(m), and others; and this was still the more remarkable, as they were entirely guided therein by the lights of their own experience, having no knowledge of Mr. Thorne's proposal, or of the sentiments of each other. From the reason of the thing, however, they uniformly concurred in the motives they suggested for such an undertaking. They asserted, that this passage would be much shorter and easier than any of those by the North-west or North-east; that it would be more healthy for the seamen, and attended with fewer inconveniencies; that it would probably open a passage to new countries; and finally, that the experiment might be made with very little hazard, at a small expence, and would redound highly to our national honour, if attended with success. It may

(m) Naval Tracts, p. 435.

may be then demanded, why it has not hitherto been attempted, and what objections have retarded a scheme so visibly advantageous? These objections, as far as they can be collected, are the fear of perishing by excessive cold, the danger of being blocked up in ice, and the apprehension that there could be no certainty of preserving the use of the compass, under or near the Pole.

In respect to the first, we have already mentioned that the ancients had taken up an opinion, that the seas in the frigid zone were impassable, and the lands, if there were any, uninhabitable. The philosophers of later ages fell into the same opinion, and maintained that the Poles were the sources and principles of cold, which of course increased and grew excessive in approaching them⁽ⁿ⁾. But when the lights of experience were admitted to guide in such researches, the truth of this notion came to be questioned, because from facts it became probable, that there might be a diversity of climates in the frigid as well as in the torrid zone. Charlton Island, in which Captain James wintered, lies in the bottom; that is, in the most Southern part of Hudson's Bay, and in the same latitude with Cambridge, and the cold there was intolerable. The servants of the Hudson's Bay Company trade annually in places ten degrees

(n) In the language of those times, the Pole was stiled *Primum Frigidum*; and it was by such groundless phrases that men pretended to account for the operations of nature, without giving themselves the trouble of experimental enquiries.

degrees nearer the Pole, without feeling any such inconvenience. The city of Moscow is in the same latitude with that of Edinburgh, and yet in winter the weather is almost as severe there as in Charlton Island. Nova Zembla hath no foil, herbage, or animals; and yet in Spitzbergen, in six degrees higher latitude there are all three, and on the top of the mountains in the most Northern part, men strip themselves of their shirts that they may cool their bodies ^(o). The celebrated Mr. Boyle, from these and many other instances, rejected the long received notion that the Pole was the principle of cold. Captain Jonas Poole, who in 1610 sailed in a vessel of seventy tons to make discoveries towards the North, found the weather warm in near seventy-nine degrees of latitude, whilst the ponds and lakes were unfrozen, which put him in hopes of finding a mild summer, and led him to believe, that a passage might be as soon found by the Pole as any other way whatever; and for this reason, that the Sun gave a great heat there, and that the ice was not near so thick as what he had met with in the latitude of seventy-three ^(p). Indeed the Dutchmen who pretend to have advanced within a degree of the Pole, said it was as hot there as in the summer at Amsterdam.

In these Northern voyages we hear very much of ice, and there is no doubt that vessels are very much hindered

(o) See Marten's Account of Spitzbergen, p. 105.

(p) Purchas Pilgrims, vol. III. p. 702.

dered and incommoded thereby. But after all, it is, in the opinion of able and experienced seamen, more formidable in appearance than fatal in its effects. When our earliest discoveries were made, and they reached farther North than we commonly sail at present, it was performed in barks of seventy tons, with some trouble, no doubt, but with very little hazard. At this day it is known, that in no part of the world there are greater quantities of ice seen than in Hudson's Bay, and yet there is no navigation safer, the company not losing a ship in twenty years, and the seamen who are used to it, are not troubled with any apprehensions about it. It is no objection to this, that we hear almost every season of ships lost in the ice on the whale fishery; for these vessels, instead of avoiding industriously seek the ice, as amongst it the whales are more commonly found, than in the open sea. Being thus continually amongst the ice, it is no wonder that they are sometimes surrounded by it; and yet the men, when the ships are lost, generally speaking, escape. But in the seas near the Pole, it is very probable, there is little or no ice, for that is commonly formed in bays and rivers during winter, and does not break up and get into the sea till the latter end of March or the beginning of April, when it begins to thaw upon the shores. It is also, when formed, very uncertain as to its continuance, being broken and driven about by the vehemence of the winds. As a proof of this we have an instance of a vessel frozen in one of the harbours.

bours of Hudson's Bay, which, by the breaking of the ice, drove to sea, and though it was Christmas, found the Straits quite free from ice^(q), which are frequently choaked with it in May and June, and made a safe and speedy passage home. All our accounts agree that in very high latitudes there is less ice. Barentz, when his ship was frozen in Nova Zembla, heard the ice broken with a most horrible noise, by an impetuous sea from the North, a full proof that it is was open. It is the invariable tradition of the Samoides and Tartars, who live beyond the Waygat, that the sea is open to the North of Nova Zembla all the year; and the most knowing people in Russia are of the same opinion. These authorities ought certainly to have more weight than simple conjectures.

The notion that approaching to a passage under the Pole would destroy the use of the compass, is a popular opinion without any just grounds to support it. For it presumes that the needle is directed by the Pole of the World; which it certainly is not, as appears from the needle's variation, and even the variation of that variation, which if this notion was true, could never happen. In Sir Thomas Smith's sound in Baffin's Bay, the variation was found to be fifty-six degrees Westward, the greatest yet known. Captain Wood is very clear upon this point, and maintains, that no danger was to be

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(q) Mr. Dobbs's Account of Hudson's Bay, p. 69, 70.

apprehended from this cause^(r). Those who asserted, that they had advanced within a degree of the Pole, estimated the variation there at five points of the compass. Captain Wood in stating the account given of the Dutch seamen's voyage by Captain Goulden, omits one very material point, of which we are informed by Mr. Boyle, which is, that one of the Dutch captains coming over to England, Captain Goulden carried him to some of the Northern Company, who were perfectly satisfied as to the truth of his relation^(s). On the whole, therefore, whether we respect reason or facts, there are no just grounds for apprehensions on this head, more especially as there are other means by which the true situation of a vessel might be determined, and the difficulty, if any arose, would be but of very short continuance. But as such a voyage could not fail of affording many new lights in respect to astronomy and geography, so in this respect also, it must necessarily ascertain fully what is at present only matter of doubt and conjecture.

As notions long received acquire from thence a degree of credit due only to truth; and as new opinions, contrary to these, and in other respects perhaps extraordinary in themselves, meet from these causes with

(r) Wood's Voyage for the Discovery of a North-east Passage, p. 139.

(s) See the honourable Mr. Boyle's History of Cold, in respect to this and a multitude of other curious particulars, which shew with how much industry and care he struggled to deliver truth from vulgar errors and fiction.

with slow and difficult belief, however they may appear to be supported by arguments, authorities, or facts (which it is presumed have been freely and fairly urged in the present case, to a degree that may at least entitle the matter to some attention), let us now proceed one step further. This shall be to shew, that what seems to be so repugnant to the common course of things (*viz.* that near the North Pole the cold should relax, and the ice be less troublesome) is perfectly conformable to the laws of nature, or which is the same thing, to the will and wisdom of our great Creator. If this can be proved, there can be no farther dispute as to the possibility of this passage; more especially when it shall also appear, that this affords a full solution of all the doubts that have been suggested, and at the same time clearly accounts for, and effectually confirms, the facts and reasonings deduced from them, which have been already advanced upon this subject. To come then at once to the point.

Sir Isaac Newton, who it is universally allowed was equally accurate, cautious, and judicious in his philosophical decisions, hath demonstrated clearly, that the figure of this our earth is not spherical, but of an oblate spheroidal form, the diameter at the equator being the greatest, and at the axis the least of all the lines that can pass through the center. He also determined, by a most curious calculation, the proportion of these diameters to be as two hundred and thirty, to two hundred and twenty-nine. These sentiments of his have been
expe-

experimentally verified by the means which he also pointed out, *viz.* observing the motion of pendulums in very different latitudes, and the actual measurement of a degree at the equator and under the Arctic circle. This last evidently proved the depression of the earth's surface towards the Pole, which no doubt gradually increases. The very learned and sagacious Dr. Hooke asserted, in one of his lectures, and brought very strong reasons to shew, that there is nothing but sea at the Poles^(t). These points then being maturely considered will be found to militate in favour of a free passage this way, and at the same time give much light into other things that have been advanced, in the course of this enquiry, by shewing the true causes of those facts that, at first sight, have appeared to many very strange and unaccountable. For example, if there be no land near the Pole, then there can be no bays in which ice can be formed to interrupt the navigation. Again, the rays of the Sun falling on so flat a surface, and being continually reflected from the water, must afford a great degree of heat to the air. At the same time this will account for the Sun's being seen by the Dutch in Nova Zembla a fortnight earlier than he should have appeared, according to astronomical calculations^(u). Many other circumstances might be mentioned, but these will doubtless occur to the intelligent, and therefore it is unnecessary to dwell longer upon them. The

(t) Hooke's posthumous Works, p. 351.

(u) See Purchas, vol. III. p. 499, 500.

The great injustice of rejecting opinions, on account of their appearing, at first sight, paradoxical, or somewhat inconsistent with notions commonly received, having been clearly shewn, and the mischievous consequences flowing from it by various instances pointed out; the foundation of this conjecture, that there may be a passage near the Pole, having been fairly stated, the popular objections to it clearly removed, the general advantage (that might be expected from thence) placed in a proper light, and the consistence of all the circumstances relative thereto, with the established course of nature, having been also rendered evident; there can be nothing more looked for respecting this matter merely in the light of a philosophical speculation. But if supporting this had been the only motive, these reflections had not employed the time of the writer, or trespassed so long upon the reader's patience. What then remains? To demonstrate, that as the possibility, practicability, and facility of such an undertaking have been insisted upon, its national utility should be shewn to deserve consideration; and that, as it is an object of the greatest importance to the public welfare, its execution should be no longer delayed. There is unquestionably no country in Europe so well situated for such an enterprize as this. The transit from Shetland to the Northern parts of Asia would, by this way, be a voyage only of a few weeks. The inhabitants of these islands and of the Orkneys are, and have been, for many years employed in the Greenland fisheries,

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and

and the natives of these isles are the persons mostly sent to the establishments in Hudson's bay. By these means they are inured to cold, to ice, and hard living, and are consequently the fittest for being employed in such expeditions. When this shall be once executed with success, it will necessarily bring us acquainted with new Northern countries, where ordinary cloaths and other coarse woollen goods will probably be acceptable, new channels of commerce would be thereby opened, our navigation extended, the number of our seamen augmented, without exhausting our strength in settling colonies, exposing the lives of our sailors in tedious and dangerous voyages through unwholesome climates, or having any other trade in prospect than that of exchanging our native commodities and manufactures, for those of other countries. This, if it could be brought about, would in the first instance, convert a number of bleak and barren islands into cultivation, connect them and their inhabitants intimately with Britain, give bread to many thousands, and by providing suitable rewards for many different species of industry, encourage population, and put an easy and effectual period to the mischiefs and scandal of emigrations. The benefits derived from these discoveries, and the commerce arising from them, will necessarily extend to all parts of our dominions. For however fit the poor people of those islands may be for such enterprizes, or however commodious the ports in their countries may be found for equipping and receiving vessels employed in these voyages, yet the

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commodities, manufactures, &c. must be furnished from all parts of the British empire, and of course be of universal advantage. These, as they are true, will it is hoped appear just and cogent reasons for wishing, that a project which has dwelt in the mouths and memories of some, and in the judgement and approbation of a few, from the time of Henry the Eighth, should be revived, and at length, for the benefit of his subjects, carried into effect, under the auspices of **GEORGE the Third.**

F I N I S.

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CON-

C O N T E N T S.

- I. Instances of Navigators who have reached high
Northern Latitudes. page 1
- II. Additional Proofs that the Polar Seas are open.
p. 15
- III. Additional Papers from Hull. p. 52
- IV. Suggestions submitted to those who may be sent
upon a Voyage for the Discovery of the North
Pole, or a communication between the Atlantic
and Pacific Oceans, within the Limits of the
Northern Hemisphere. p. 62
- V. Thoughts on the Probability, Expediency, and
Utility of discovering a Passage by the North
Pole. p. 69

E R R A T A.

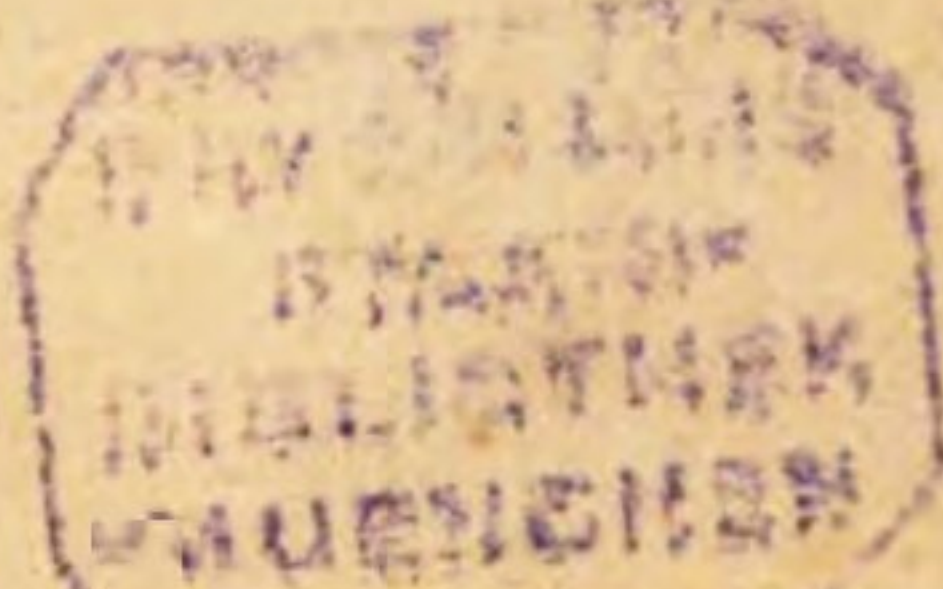
Page 27. Note (1) line 5. for $78^{\circ} 30'$ read 79 degrees.

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